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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)

2. (**Currently Amended**) An apparatus for reconstructing color filter array images, comprising:

an image recording module for generating an image of spatially consistent sampled values output from a color filter array; each [[pixel]] of a plurality of pixels in the image having a location at which a sampled value of only one of a plurality of color channels is recorded; and

an image reconstruction module for linearly transforming the sampled value at the location of a selected one of the plurality of pixels [[pixel]] in the image to estimate a color channel not recorded by the image recording module at the location of the selected pixel in the image;

wherein the image reconstruction module computes coefficients of a linear transformation using [[the one of the plurality of]] color channels of sampled values of the plurality of pixels in the image without interpolating values of other color channels of [[such]] the plurality of pixels not recorded in the image by the image recording module.

3. (Original) The apparatus according to claim 2, wherein image reconstruction module computes the coefficients by computing statistics that depend on the sampled value but not the position of the samples of at least two color channels within a window of the image.

4. (**Currently Amended**) The apparatus according to claim 3, wherein the image reconstruction module computes the coefficients a_c and [[b'$_c$]] h_c' of the linear transformations given by:

[[$G(y,x) = a_r R(y,x) + b_r',$]] $G(y,x) = a_r R(y,x) + h_r',$

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[[$G(y,x)=a_bB(y,x)+b_b'$,]] $\underline{G(y,x)=a_rR(y,x)+h_r'}$,

<u>in which "y" denotes a row of the image, "x" denotes a column of the image, and $G(y,x)$, $R(y,x)$, and $B(y,x)$ denote green, red, and blue color samples of the image, respectively, and</u>

using the following equations, in which μ_C is the mean and σ_C^2 is the variance of the color channels "C" within the window of the image, where each color channel "C" <u>(or "c")</u> is either a green, blue, or red color channel which is identified as "G", "B" (or "b"), and "R" (or "r"), respectively:

$$a_r=\sqrt{\frac{\sigma_G^2}{\sigma_R^2}},$$

$$a_b=\sqrt{\frac{\sigma_G^2}{\sigma_B^2}},$$

[[$b'_r=\mu_G-a_r\mu_R$,]] $\underline{h_r'=\mu_G-a_r\mu_R}$,

[[$b'_b=\mu_G-a_b\mu_B$.]] $\underline{h_b'=\mu_G-a_b\mu_B}$.

5. (Previously Presented) The apparatus according to claim 2, wherein the image reconstruction module fits the linear transformation to at least one pair of sums of color channels that are summed along lines through a window of the image.

6. (Canceled)

7. (Previously Presented) The apparatus according to claim 24, wherein the image reconstruction module fits the pair of sets of color channel sums using least squares linear regression.

8. (Previously Presented) The apparatus according to claim 5, wherein the image reconstruction module determines one or more of a confidence and a variance measure for the sums of the color channels.

9. (Previously Presented) The apparatus according to claim 5, wherein the reconstruction module computes the sums of color channels along lines of columns or rows, or a combination thereof, of the window.

10. (Canceled)

11. (Canceled)

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12. **(Currently Amended)** A method for reconstructing color filter array images, comprising:

recording an image of spatially consistent sampled values output from a color filter array; each [[pixel]] of a plurality of pixels in the image having a location at which a sampled value of only one of a plurality of color channels is recorded;

computing coefficients of a linear transformation using [[the one of the plurality of]] color channels of sampled values of the plurality of pixels in the image without interpolating values of other color channels of [[such]] the plurality of pixels not recorded in the image; and

using the linear transformation and the sampled value at the location of a selected one of the plurality of pixels [[pixel]] in the image to estimate a color channel not recorded [[by the image recording module]] at the location of the selected pixel in the image.

13. (Original) The method according to claim 12, further comprising computing the coefficients by computing statistics that depend on the sampled value but not the position of the samples of at least two color channels within a window of the image.

14. **(Currently Amended)** The method according to claim 13, further comprising computing the coefficients a_c and [[b'$_c$]] $\underline{h_c'}$ of the linear transformations given by:

$$[[\, G(y,x) = a_r R(y,x) + b_r',]] \; \underline{G(y,x) = a_r R(y,x) + h_r',}$$

$$[[\, G(y,x) = a_b B(y,x) + b_b',]] \; \underline{G(y,x) = a_r R(y,x) + h_r',}$$

in which "y" denotes a row of the image, "x" denotes a column of the image, and $G(y,x)$, $R(y,x)$, and $B(y,x)$ denote green, red, and blue color samples of the image, respectively, and

using the following equations, in which μ_C is the mean and σ_C^2 is the variance of the color channels "C" within the window of the image, where each color channel "C" (or "c") is either a green, blue, or red color channel which is identified as "G", "B" (or "b"), and "R" (or "r"), respectively:

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$$a_r = \sqrt{\frac{\sigma_G^2}{\sigma_R^2}},$$

$$a_b = \sqrt{\frac{\sigma_G^2}{\sigma_B^2}},$$

$$[[b'_r = \mu_G - a_r\mu_R,]]\ \underline{h_r' = \mu_G - a_r\mu_R,}$$

$$[[b'_b = \mu_G - a_b\mu_B.]]\ \underline{h_b' = \mu_G - a_b\mu_B.}$$

15. (Previously Presented) The method according to claim 12, wherein said computing further comprises fitting the linear transformation to at least one pair of sums of color channels that are summed along lines through a window of the image.

16. (Canceled)

17. **(Currently Amended)** The method according to claim 26, further comprising <u>fitting</u> the pair of sets of color channel sums [[is fit]] using least squares linear regression.

18. (Previously Presented) The method according to claim 15, wherein one or more of a confidence and a variance measure are determined for the sums of the color channels.

19. (Previously Presented) The method according to claim 15, wherein the sums of color channels is computed along lines of columns or rows, or a combination thereof, of the window.

20. (Canceled)

21. **(Currently Amended)** A method for reconstructing color filter array images, comprising:

(a) acquiring an image using a color filter array that records <u>spatially consistent</u> samples of a plurality of color channels with only one sample of <u>different ones of</u> the plurality of color channels being recorded at each pixel in the image;

(b) assigning a selected pixel in the image to a window that may be smaller than the image and that may overlap other windows assigned to other pixels in the image;

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(c) using the color channels of recorded samples to estimate coefficients for a linear transformation for the window assigned to the selected pixel in the image without interpolating values [[for the other]] of [[the plurality of]] color channels not recorded in the image;

(d) estimating a value for one or more of the plurality of color channels not recorded at the selected pixel location with (i) the recorded sample at the selected pixel location and (ii) the linear transformation for the window assigned to the selected pixel; and

(e) repeating (b), (c) and (d) for other selected pixels in the image.

22. (Previously Presented) The method according to claim 21, further comprising estimating the coefficients of the linear transformation at (c) by fitting the linear transformation to at least one pair of sums of color channels that are summed along lines through the window assigned to selected pixel in the image.

23. (Previously Presented) The apparatus according to claim 8, wherein the image reconstruction module selects rows or columns of the window that have a low variance within their sum of color channels and determines with a confidence measure which of sums of the rows or columns of the window to select to fit a line thereto.

24. **(Currently Amended)** The apparatus according to claim 9, wherein the image reconstruction module computes the pair of sums of color channels along rows and columns of a window by (a) determining sums of pixel values of two color channels along those rows and columns of the window that contains samples of both color channels, and (b) fitting a line to the sums of pixels values [[along the rows and columns of the window of]] corresponding to one color channel against the sums of pixel values corresponding to the other color channel.

25. (Previously Presented) The method according to claim 18, further comprising:

selecting rows or columns of the window that have a low variance within their sum of color channels; and

determining with a confidence measure which of sums of the rows or columns of the window to select to fit a line thereto.

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26. (**Currently Amended**) The method according to claim 19, further wherein the pair of sums of color channels is computed along rows and columns of a window by (a) determining sums of pixel values of two color channels along those rows and columns of the window that contains samples of both color channels, and (b) fitting a line to the sums of pixels values [[along the rows and columns of the window of]] corresponding to one color channel against the sums of pixel values corresponding to the other color channel.

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